From May 24, 2023 to June 5, 2023 I (Mia Stafford) have been working on 3D Modeling an Orchid Plant in Solidworks. I am very proud of this project. It is comprised of a vase, two leaves, a single stem, as well as multiple flowers and buds of different sizes. Its structure resembles that of a real orchid flower, with the leaves at the base, the stem curving off to the side, and the flowers mainly at the top of the plant.

I was going for a sort of simplified realism for the visuals. I thought that getting to a point that you could see every detail would be a bit overkill, especially since orchids are so complex. That being said, visuals were a main statement of this project; putting together what I’ve learned and making it all pretty. I had four main product goals they are as follows:

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| Summary | In-Depth Goal | Result |
| Make the project bend in all three dimensions. | This would require some sort of boundary surfacing. I thought especially making the stem in a way that it looked different from every view would make it feel more realistic. To meet this goal, I need to avoid symmetry as much as possible and make it look different on every different view. | The plant is very different from each point of view, the stem especially. It winds and turns in the three directions, but is not so hectic that it appears unrealistic. I do really like how the stem turned out. |
| Add a bend to the petals/leaves/etc. | I wanted the leaves and petals to have a realistic/imperfect look, and I knew this would be accomplished by adding volume in multiple different directions. I’d need to have a bend to all the petals and leaves to accomplish this goal. | Both the leaves and petals are bent (for most cases in more than one direction). This means that I have met this goal. Solidworks was finnicky about adding bends in multiple directions at times, but I figured things out after a little bit of struggle. This is definitely a big visual aid, and really brings the flowers and leaves to life. |
| Multiple parts to the inside of the parts of the orchid. | I knew that the inside petals of the orchid would be some of the most difficult and time consuming to create, simply because they are so complex. However, I didn’t want to shy away from this challenge. To accomplish this goal, I’d need the part with the inside petals of the orchid to be complete, and accurate to photos. | In the inside of the orchid, I included the following: a short extruded knob, a “back pipe” connecting everything, two side petals framing the knob, a long front petal (with curls on the ends), and two “cushions” resting on the back pipe. It was quite frustrating to struggle with these parts, but in the end, I’m very proud of how they turned out. |
| Have variety in the sizes of flowers | Plants are hardly ever symmetrical and uniform, and this applies to the sizes of them too. Having only one size of flower or bud would end up looking strange and boring, so for this goal, I want to have three different sizes of flowers and tree different sizes of buds. | I used the scale tool to create a large, medium, and small flower. As well as a large, medium, and small bud. This made the project look so much better than it would have with just one flower size. I’m really glad I did this. |

As previously stated, this project wasn’t really focused on learning new things, as some of my past projects have been. However, I still learned and became more familiar with many different tools and features. Here are the learning goals I made for myself:

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| Summary | In-Depth Goal | Result |
| Use a reference image. | I’ve looked at adding reference images a little bit in the past, but never put it into action. I figured that because orchids are not factory-produced and perfect in a way that post projects are, it would be useful to have a flower to work off of. I must use at least one reference image to fulfill this goal. | I used a reference image for the parts of the orchid flower, it was extremely useful for keeping things realistic. I will definitely incorporate more of these in the future. |
| Incorporate an assembly. | I haven’t used an assembly since last semester and am afraid that I’m getting a little rusty. This goal is a simple one  – a refresher – based off of whether or not I assembled the parts. | I made two subassemblies and a full assembly. This was DEFINENTLY a good choice, things went together smoothly and were easily adjustable after they had been set in place. |
| Use “closed shape” boundary surfacing. | This concept was in my job skills presentation, I want to use this method of surfacing 3+ times, in three fairly different ways. | I used Closed Shape surfacing on the vase, the stem, and the flower bud. This type of surfacing is so cool because you can use it in many situations. |
| Scale different parts. | I’ve never scaled a part before, but I figured that logically there must be some way to quickly change the size of a part. After a few google searches, finding conformation that this tool existed, I created the goal that I needed to use the scale tool 4+ times. | I scaled both the flower and flower bud twice each, to create a large, medium, and small flower. As well as a large, medium, a small flower bud. This was an extremely useful feature, and I’m glad I know how to use it now. It also helped me to quickly and easily complete my project goal #4. |

For this project, there wasn’t really a set work ethic. It was mostly just trial and error, with numerous detours for messing around and experimenting with different ways to get the shape I wanted. Learning from mistakes and side-experiments was crucial for success. Surfacing works in an odd way where you set up all of the sketches and preparations, and then activating the boundary surface in the end becomes the moment of truth. Towards the start of the project, there were a few more fails than successes in this sense. This made frustration prominent and perseverance key. As I went along, however, I identified common reoccurring problems and how to fix them. It all comes down to trial and error.

Here is an image of the Orchid once it is all put together:

